

# Lifetime Wool - Target Liveweights for the Ewe Flock

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## ABSTRACT

Comparing the profitability of a range of farm management systems using computer modelling ensures that optimal systems are identified for implementation on farms. The Great Southern version of MIDAS was used to analyse the 2001 progeny results from 'Lifetime Wool', a project aimed at developing principles for managing ewes to optimise their productivity. The analysis showed differences in farm profit of up to \$50 000 per year from varying nutritional treatments. Optimal target liveweights will be determined when further trial results are available.

## AIMS

The 'Lifetime Wool' project aims to determine the optimal allocation of feed resources and then develop profitable ewe management guidelines for woolgrowers across Australia. A previous analysis based on the results of Kelly (1) showed the effect of varying ewe nutrition on progeny wool production could increase whole farm profit by as much as \$5 per ewe per year (2). This paper demonstrates how data from 'Lifetime Wool' will be used to calculate the profitability of different target liveweight patterns for reproducing ewes on farms in Australia.

## METHOD

The whole-farm computer model MIDAS represents a 'typical' farm in the Great Southern of WA (3). It comprises a mixed cropping and merino sheep farm. Mathematical equations are used to represent sheep live weight patterns, wool and meat production, pasture growth and other biological components of a farm. Farm costs and commodity prices are included in the model. The results presented are for a farm with 3000 ewes.

For this paper MIDAS was used to compare the profitability of 5 nutritional treatments during lactation imposed on 2 groups of ewes. One group of ewes lost condition and the other maintained condition during pregnancy (4). A feed budget for the whole flock was then calculated based on the liveweight patterns of the ewes in the trial. The feed budget calculated the optimum stocking rate and level of grain feeding that would maximise profit if ewes followed that liveweight pattern. The value of production from both the ewes and their progeny was calculated and compared to the costs associated with achieving the live weight responses. The results are presented as response curves of profit to nutrition.

## RESULTS

For the 2001 experimental results farm profitability is very responsive to nutrition during lactation. Farm profit increased by between \$40 000 and \$50 000 per farm per year with increasing feed availability up to 1500 kg/ha DM in both treatment groups (figure 1).

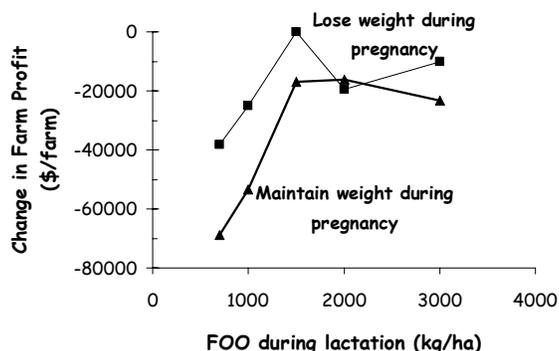
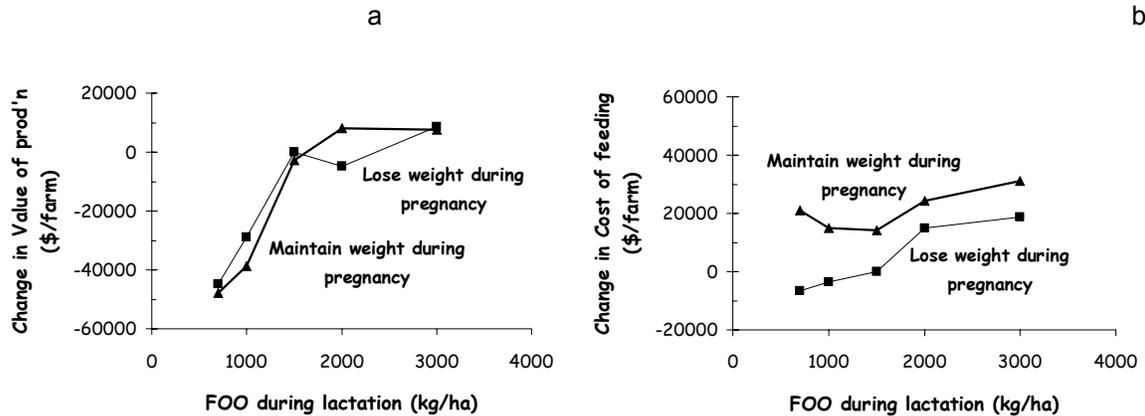


Figure 1: Difference in farm profit with varying nutrition of ewes during pregnancy and lactation

The response curves are based directly on the experimental results and include some unexplained biological variation. The big difference between the 1500 and 2000 points is caused by this variation, but with only 1 year of data it is not possible to conclude which point is correct.

Changes in farm profitability are determined by differences in the value of production from the flock and differences in the costs of providing the required feed. The difference in the value of production is the sum of progeny fleece value, ewe fleece value, progeny survival and conception in the following year. The value of production increased with increasing nutrition up to 1500 kg/ha (figure 2a).



**Figure 2: Difference in a) value of production of flock and b) cost of achieving target liveweights with varying nutrition during pregnancy and lactation**

The difference in the cost of providing the required feed is determined by the stocking rate and the amount of supplement required to achieve the target liveweights. Higher stocking rate and lower supplementary feed contributed approximately \$10 000 towards the profitability of the farms on which the ewes lost weight during pregnancy compared to maintaining weight during pregnancy (figure 2b).

## CONCLUSION

This analysis demonstrates the importance of quantifying target liveweights for ewes. Results from the first year of the trial had a range in profit of \$50 000 per farm per year for different nutritional treatments for the ewes. This is a large difference in profit and indicates the magnitude of difference that farmers may be able to achieve if optimum liveweight targets can be calculated.

To identify optimum targets will require analysis of more of the experimental results from subsequent years of the trial. This will occur as the data becomes available. To date only 1 year of data has been analysed, however, by the completion of the trial there will be 3 years of small plot trial results.

## KEY WORDS

MIDAS, economics, profitability, liveweight, ewe nutrition

## ACKNOWLEDGMENTS

The Lifetime Wool project was initiated as a cooperative project between the Department of Primary Industries, Victoria and the Department of Agriculture of Western Australia. Since, 2001 it has become a National project funded by Australian Wool Innovation Limited with on-farm experimental sites in all the main wool producing states.

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